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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/940,917	08/28/2001	Gurtej Singh Sandhu	303.676US2	6986

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EXAMINER

VOCKRODT, JEFF B

ART UNIT

PAPER NUMBER

2822

DATE MAILED: 01/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/940,917

Applicant(s)

SANDHU ET AL.

Examiner

Jeff Vockrodt

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 October 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 44,45 and 60-83 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 44,60,62-64,66-68,70-72,74-77,79-81 and 83 is/are rejected.
- 7) ☒ Claim(s) 45,61,65,69,73,78 and 82 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

This office action is in response to the amendment filed on October 18, 2002. Claims 44-45 and 60-83 are pending.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 44, 60, 62-64, 66-68, 70-72, 74-77, 79-81, and 83 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Pat. No. 5,278,100 ("Doan") (cited by applicant).

Claims 44 and 66. Doan teaches a CVD process for depositing titanium silicide contacts on a semiconductor wafer. The device comprises: a conformal titanium silicide layer (60; Fig. 3) formed by reacting silane and tetradimethylamino titanium to deposit a TiSi_x layer (a layer of titanium alloy) (Doan, col. 2, ll. 57 to col. 3, ll. 64); the titanium silicide layer (60) is coupled to an active area (54) thereby constituting a titanium silicide contact coupled to the layer (60). Doan further teaches annealing to incorporate silicon from the wafer into the deposited layer.

Claim 60. Doan teaches a semiconductor substrate (wafer 52; Fig. 3); the active layer (54) is inherently part of an electronic device (see also col. 1, ll. 13-23); an insulating layer (BPSG 56) over the active region (54); and the titanium silicide and silicide contact as discussed above relative to claim 44.

Claims 62, 75-76, and 79-81. See treatment of claim 60. BPSG (56) includes SiO_2 .

Claims 63-64, 70, and 74. See treatment of claim 60. The active areas in Doan are intended to apply to the source and drain regions of a transistor. See col. 1, ll. 24-29 and col. 2, ll. 5-14.

Claim 68. See treatment of claim 60.

Claims 67, 71, and 72. See treatment of claim 60. The aspect ratio of the contact opening 58 is high (from Fig. 3, the height is much larger than the width of the base.

Claim 77. See treatment of claims 60. The active areas in Doan are intended to apply to the source and drain regions of a transistor. See col. 1, ll. 24-29 and col. 2, ll. 5-14. The aspect ratio of the contact opening 58 is high (from Fig. 3, the height is much larger than the width of the base.

Claim 83 is a product-by-process claim. Specifically, it claims the integrated circuit comprising an alloy layer produced using a method including: forming a seed layer supported by a substrate by combining a first precursor with a first reducing agent; and forming the titanium layer supported by the substrate by combining a titanium containing precursor with the seed layer. The claimed alloy layer is not limited to any particular reducing agent and therefore includes silicon sources. The specification makes clear that this method can be used to form a titanium alloy. (Spec., ¶ bridging pages 7-8). The titanium silicide made by the claimed process appears to be the same or similar to the titanium silicide layer produced by Doan and is therefore anticipated by Doan. See In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985).

Allowable Subject Matter

Claims 45, 61, 65, 69, 73, 78, & 82 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 45, 61, 65, 69, 73, 78, & 82 are allowed for the reasons set forth in the office action mailed July 18, 2002.

Response to Arguments

Applicant's arguments with respect to claims 44, 60, 62-64, 66-68, 70-72, 74-77, 79-81, and 83 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning communications from the examiner should be directed to Jeff Vockrodt at (703) 306-9144 who can be reached on weekdays from 9:30 am to 5:00 pm EST. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian, can be reached at (703) 308-4905.

The fax numbers for this Group are (703) 305-3432, (703) 308-7722, (703) 305-3431, and (703) 308-7724. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist at (703) 308-0956.

January 7, 2003

J. Vockrodt



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